Tipping the energy world off its axis

Four large-scale upheavals in global energy set the scene for the new *Outlook*:

- The **United States** is turning into the undisputed global leader for oil & gas
- Solar PV is on track to be the cheapest source of new electricity in many countries
- China’s new drive to “make the skies blue again” is recasting its role in energy
- The future is **electrifying**, spurred by cooling, electric vehicles & digitalisation

These changes brighten the prospects for affordable, sustainable energy & require a reappraisal of approaches to energy security

There are many possible pathways ahead & many potential pitfalls if governments or industry misread the signs of change
India takes the lead, as China energy growth slows

Old ways of understanding the world of energy are losing value as countries change roles: the Middle East is fast becoming a major energy consumer & the United States a major exporter.
As China moves global energy markets, again

Change in world energy demand by fuel

Low-carbon sources & natural gas meet 85% of the increase in global demand: China’s switch to a new economic model & a cleaner energy mix drives global trends.
China, India & the US lead the charge for solar PV, while Europe is a frontrunner for onshore & offshore wind: rising shares of solar & wind require more flexibility to match power demand & supply.
The future is electrifying

Electricity generation by selected region

- China
- United States
- India
- European Union
- Southeast Asia
- Middle East
- Africa

2016 Growth to 2040

TWh

Sources of global electricity demand growth

- Industrial motors
- Other
- Electric vehicles
- Large appliances
- Connected & small appliances
- Cooling

India adds the equivalent of today’s European Union to its electricity generation by 2040, while China adds the equivalent of today’s United States
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The Sustainable Development Scenario reduces CO$_2$ emissions in line with the objectives of the Paris Agreement, while also tackling air pollution and achieving universal energy access.
Sustainable investment needs

Average annual investment in the New Policies and Sustainable Development Scenarios, 2017-2040

The Sustainable Development Scenario requires 15% additional investment to 2040; two-thirds of energy supply investment are needed for electricity generation & networks.
Conclusions

- Progress is being made towards the SDGs, but under current trends the goals on climate change, air pollution and universal access will not be met.
- Our strategy for sustainable energy shows that concerted action to address climate change is fully compatible with global goals on universal access & air quality.
- The Sustainable Development Scenario requires an additional 15% of investment and profound changes in energy production & use.
- There are strong synergies between renewable energy and energy efficiency that can be harnessed to accelerate the clean energy transition.
- Electrification & digitalisation are the future for many parts of the global energy system, creating new opportunities but also risks that policy makers have to address.